Manure, phosphorus, and 125 site-years of edge-of-field runoff measurements

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Wisconsin Agribusiness Classic

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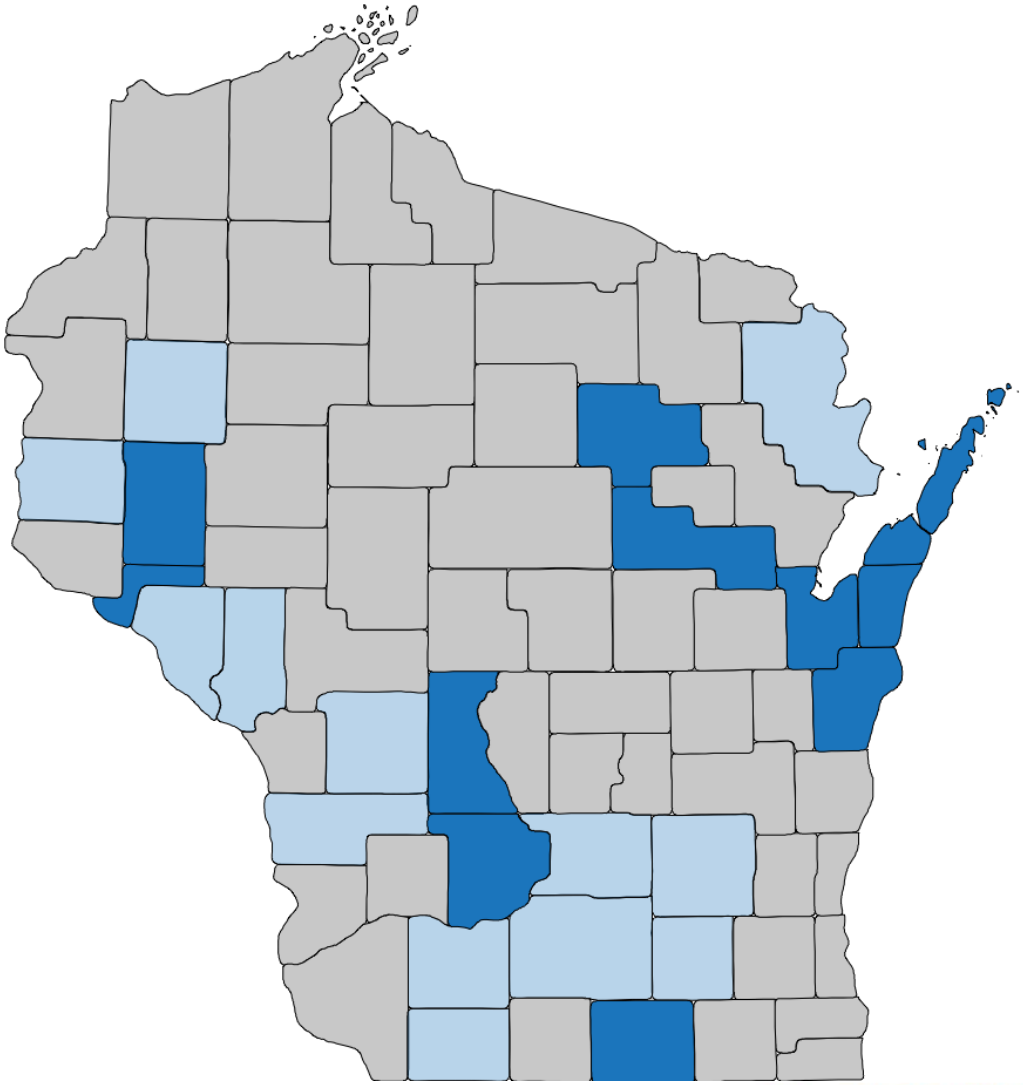
DISCOVERY FARMS WISCONSIN

Oh interesting, so where is the farm?

At our core: A farmer-led water quality research and educational program



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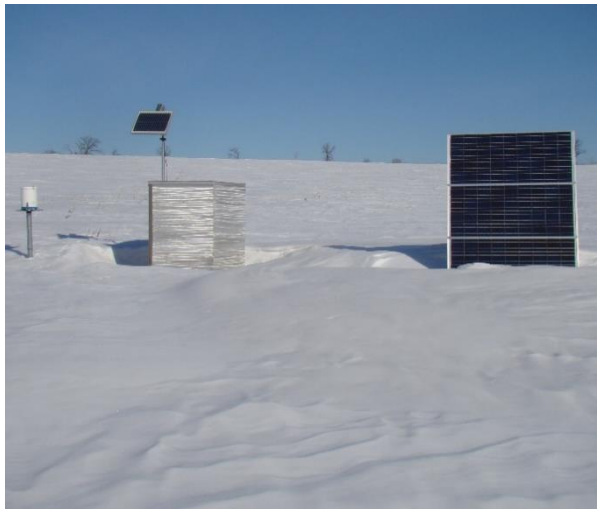
Results are from farms operated by Wisconsin and Minnesota farm families

Weather ● Soil

Runoff ● Sediment

Nitrogen ● Phosphorus



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USGS
science for a changing world

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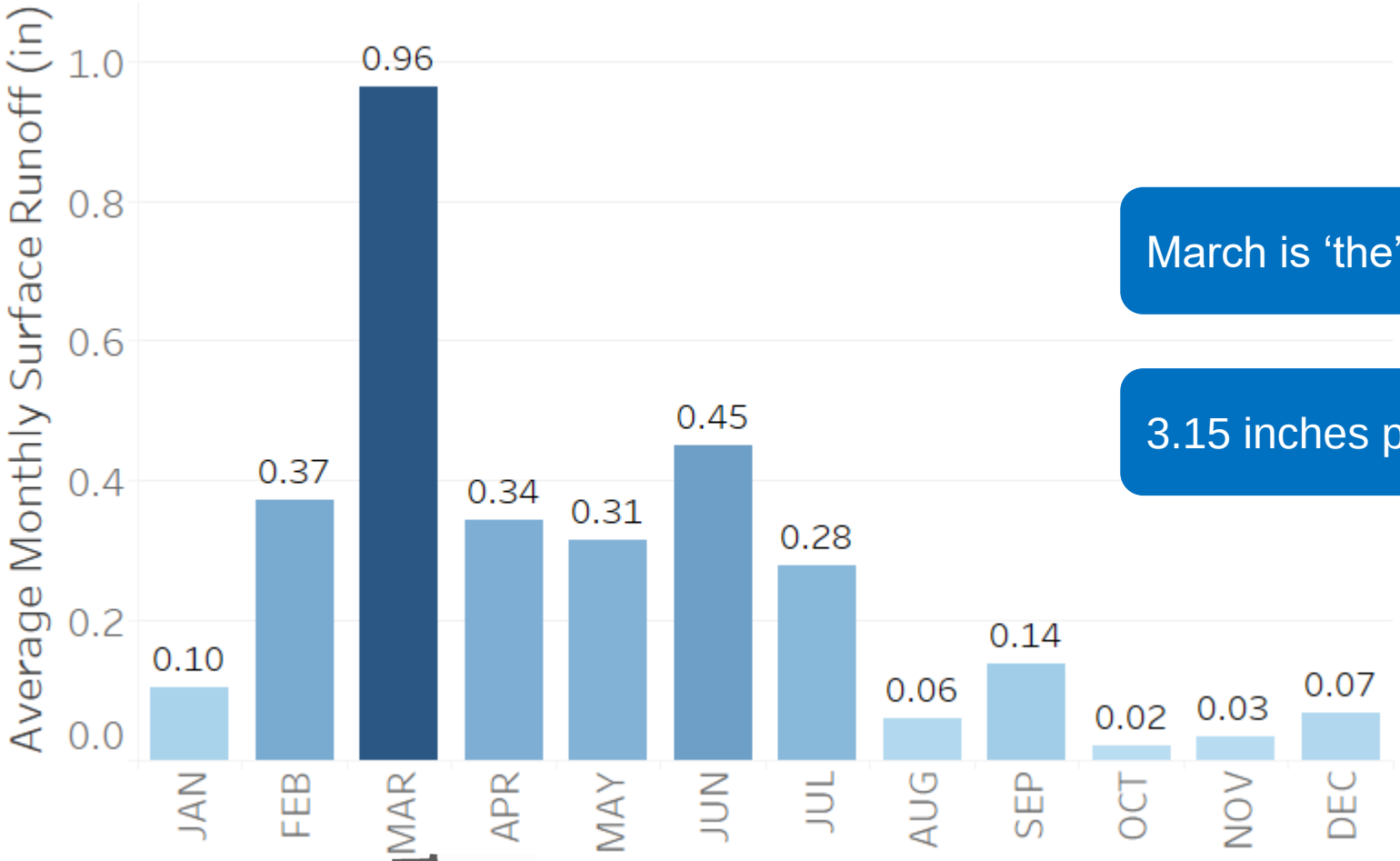
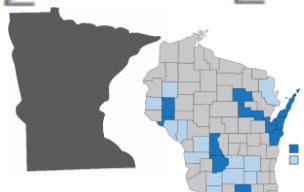
We know that surface runoff will happen, **you can control what is in it**



March is 'the' month

3.15 inches per year



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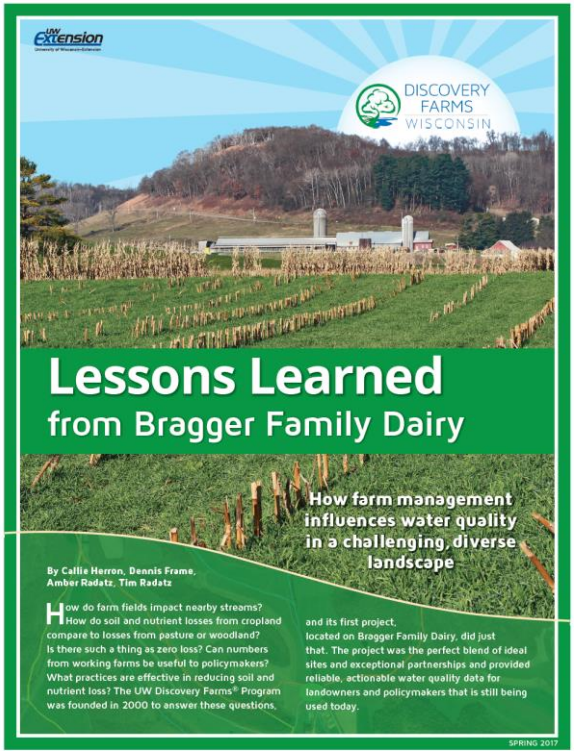
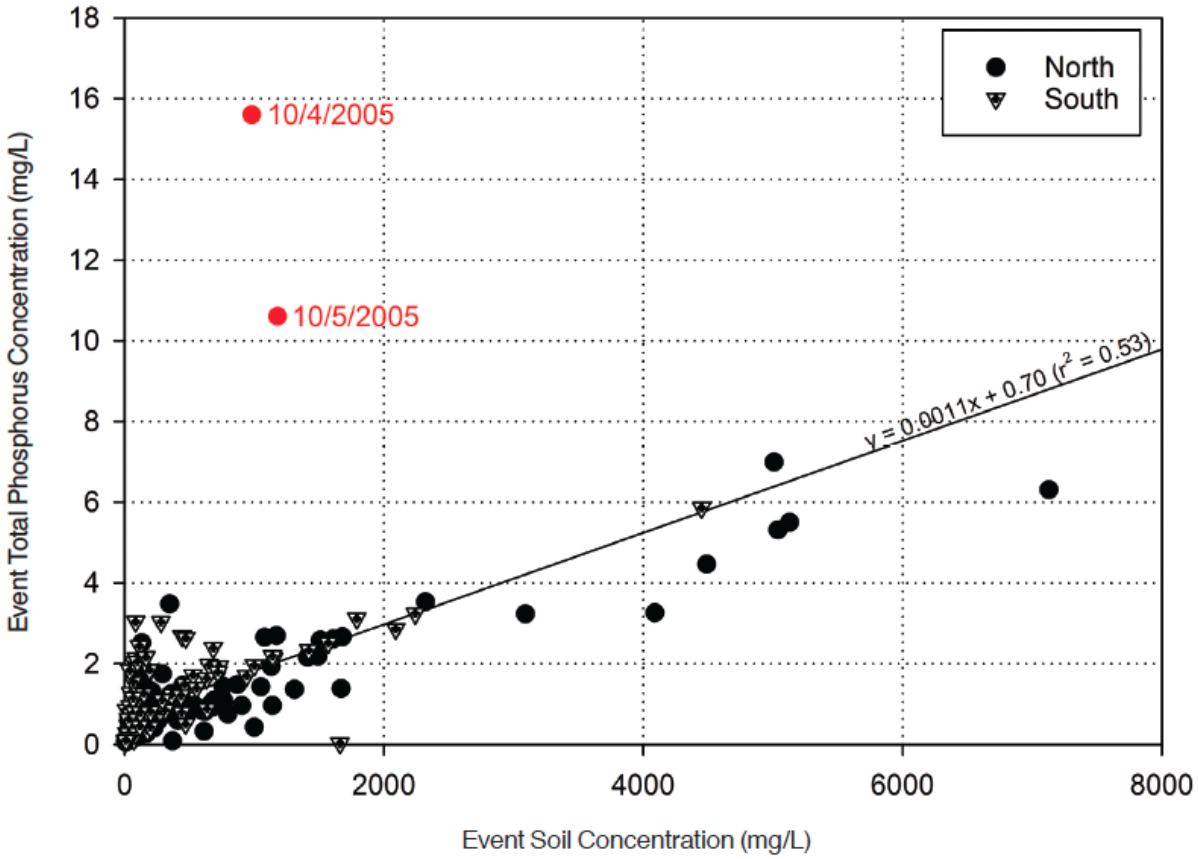
Timing is almost everything:

The interaction between manure and critical runoff periods

The numbers that don't follow the trend indicate impact from manure application shortly before runoff





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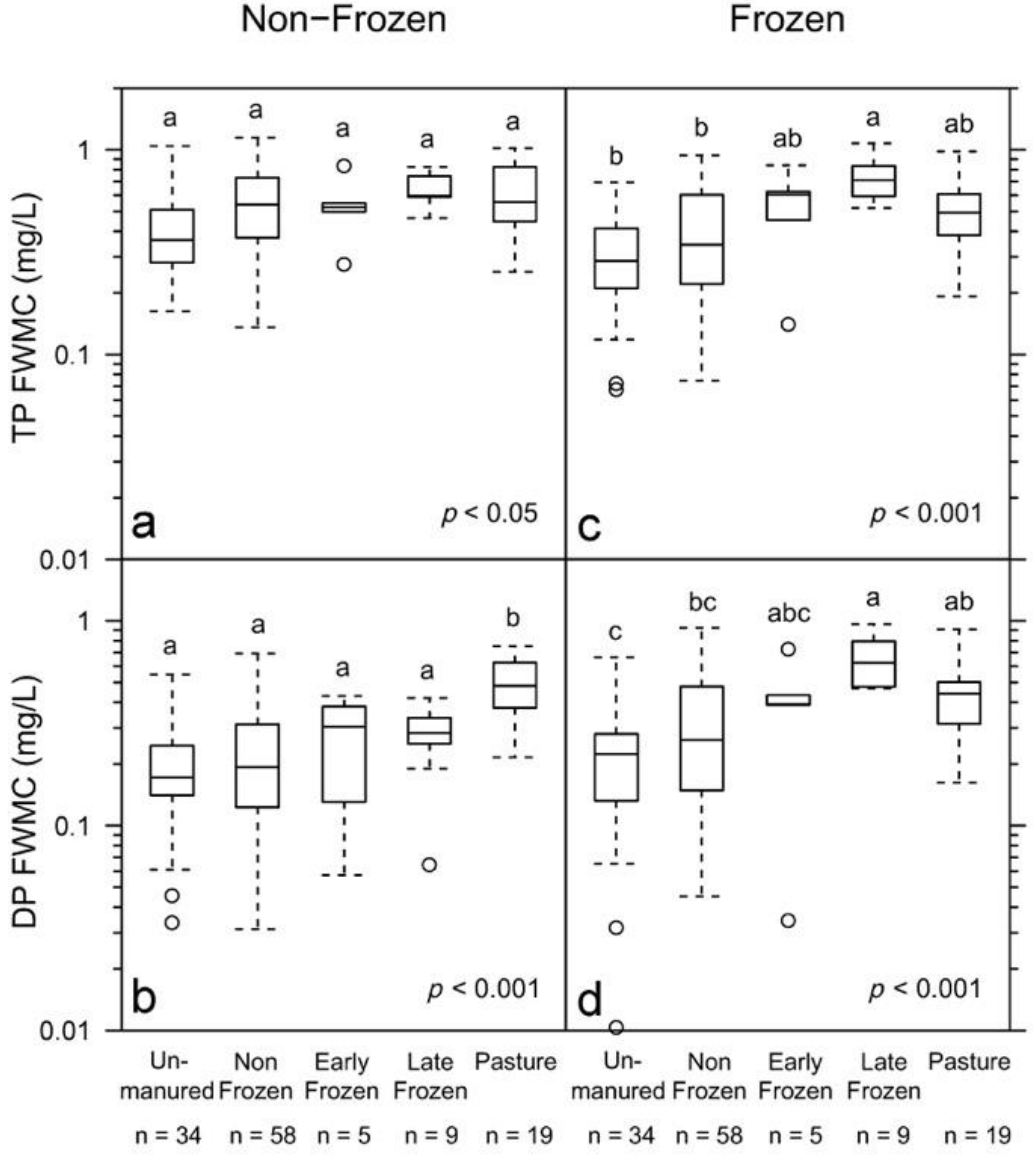
But Matt says….

There is no significant effect of manure timing on TP or DP in frozen or non-frozen seasons, the impact is more subtle



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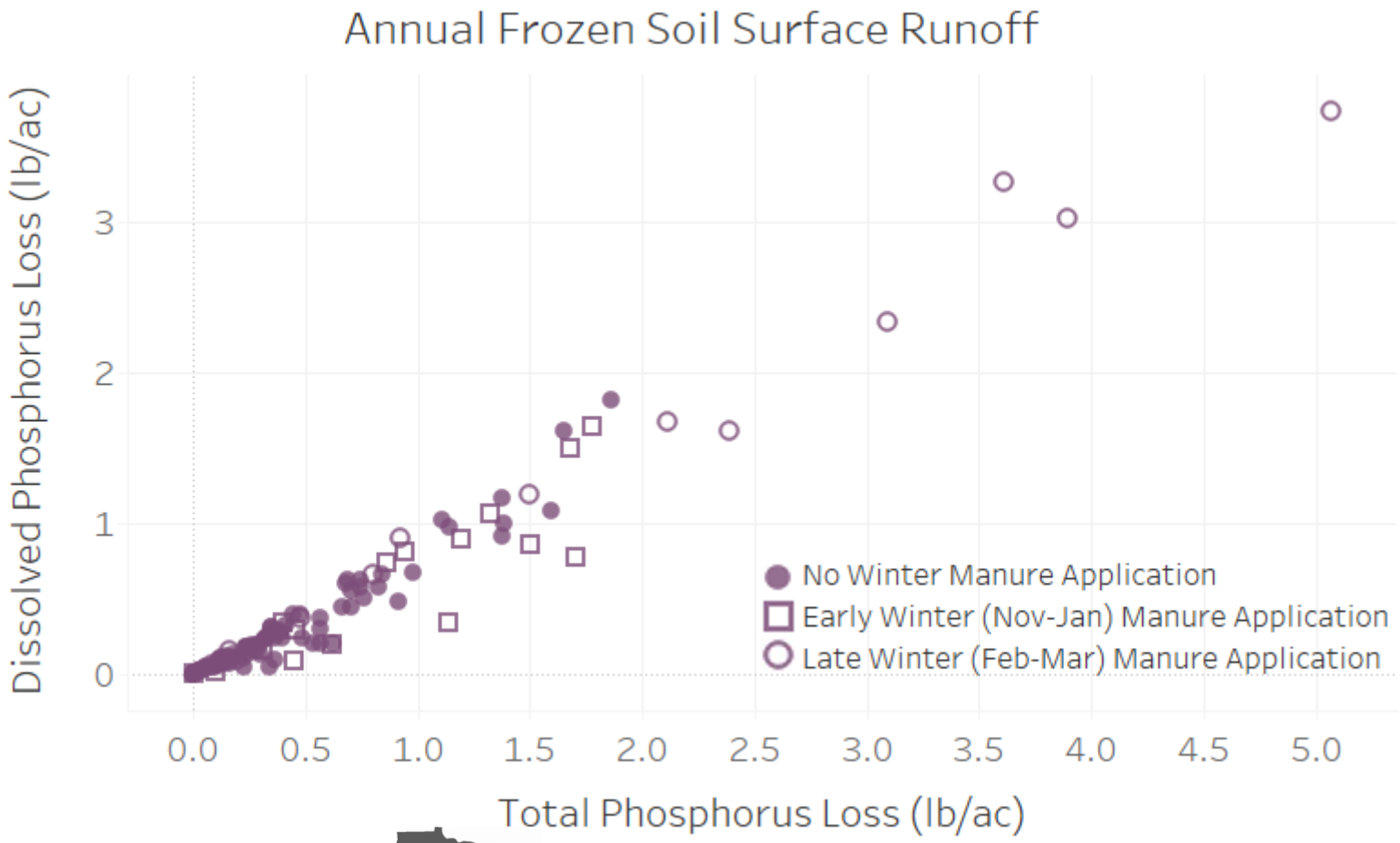
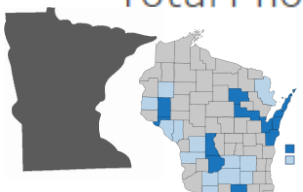
Late winter manure application can increase phosphorus loss in snowmelt by **2 to 4 times**





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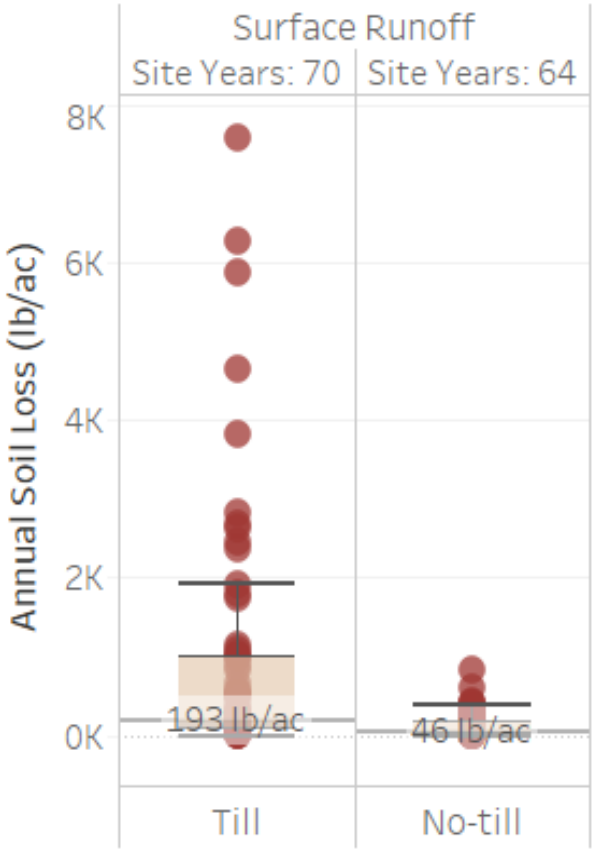
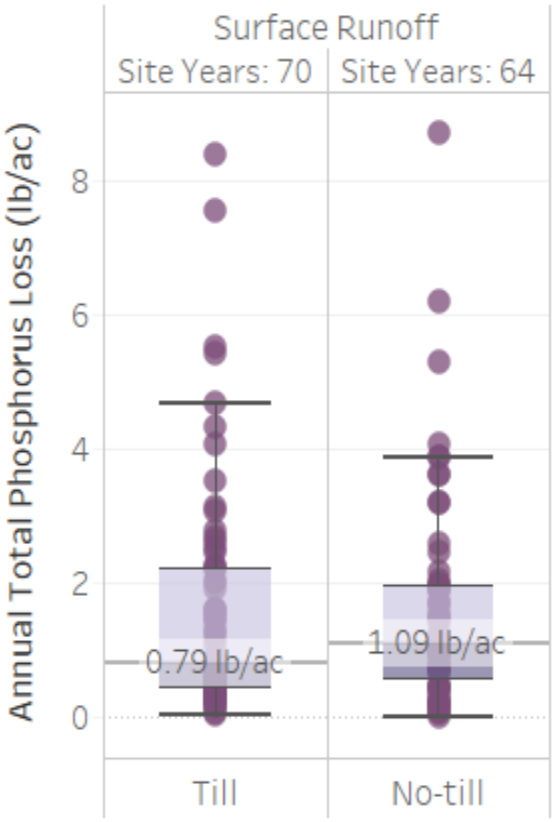
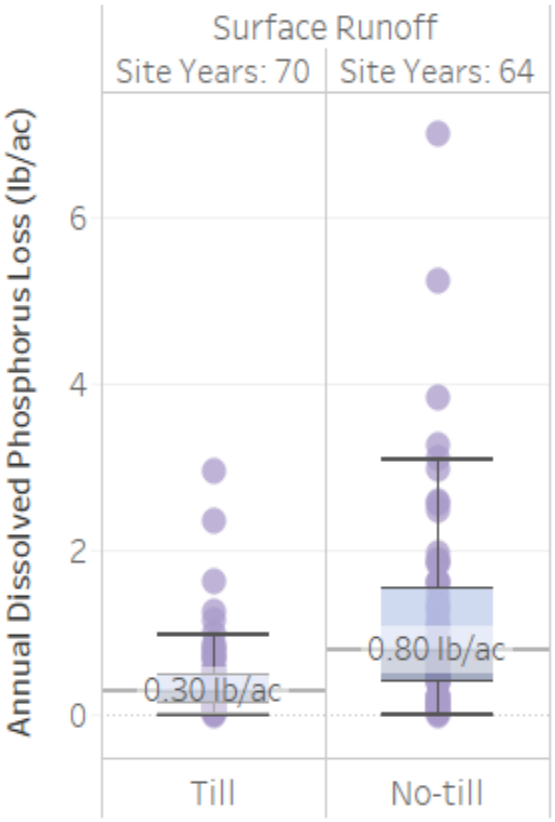
Controlling soil losses is only the first step to managing phosphorus loss.



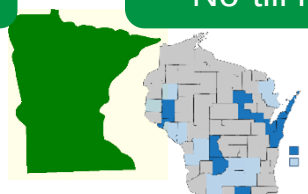




Till median: 193 lb/ac
No-till median: 46 lb/ac

Till median: 0.79 lb/ac
No-till median: 1.09 lb/ac

Till median: 0.30 lb/ac
No-till median: 0.80 lb/ac



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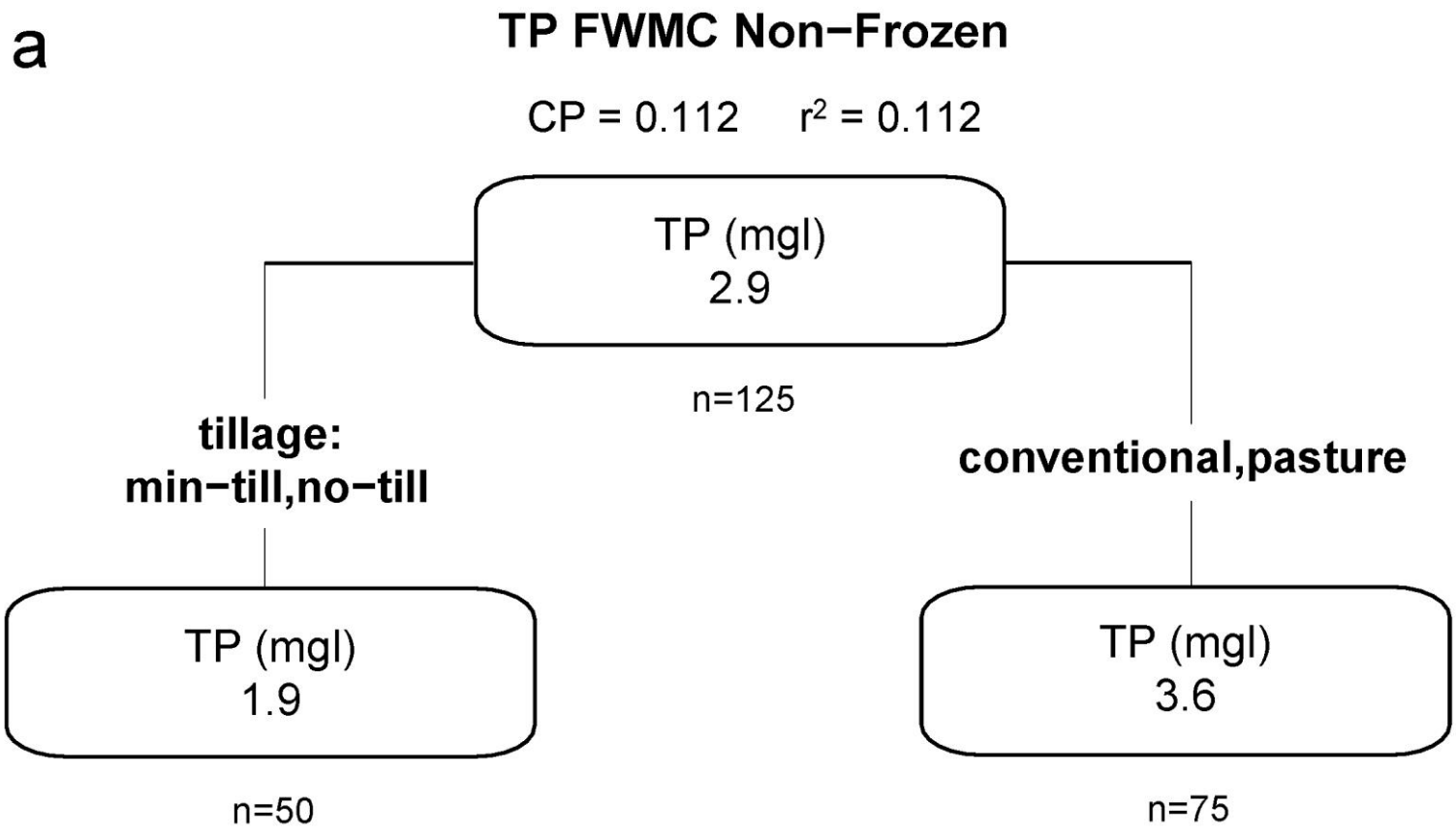
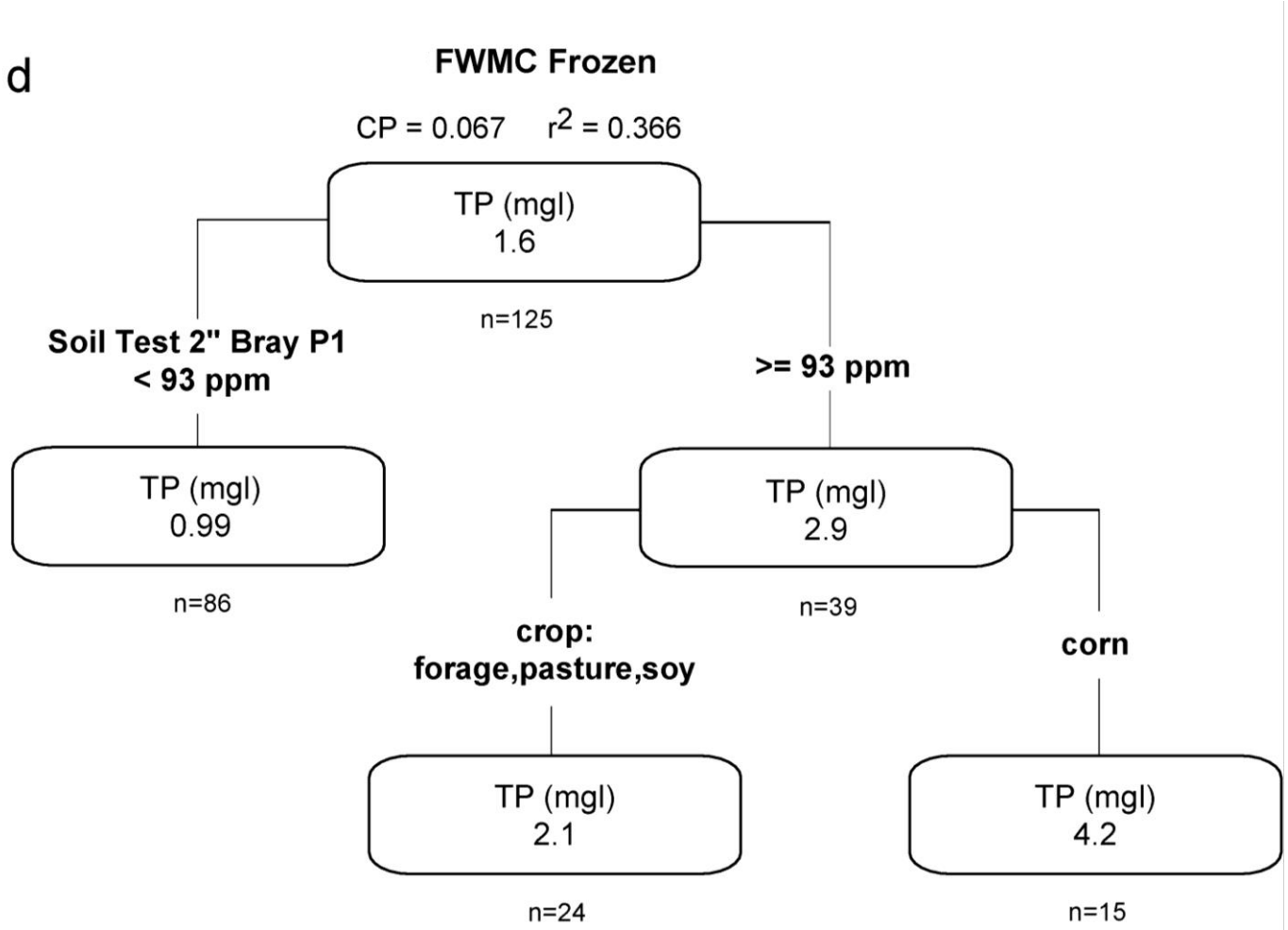
Total phosphorus concentrations in the **non-frozen** season is driven mostly by tillage



Total phosphorus concentrations in the **frozen** season is more complicated



Nutrients should be **placed** below the soil surface but not with so much disturbance that soil loss becomes an issue

- ✓ Low disturbance incorporation
- ✓ Into a living cover

If you'd like a little light bedtime reading…

Effects of Manure and Tillage on Edge-of-Field Phosphorus Loss in Seasonally Frozen Landscapes

- Zachariah Zopp, Matthew D. Ruark, Anita M. Thompson, Todd D. Stuntebeck, Eric Cooley, Amber Radatz and Timothy Radatz

- Journal of Environmental Quality

Key lessons from these results

#1 Land use and soil characteristics influence runoff and losses. Some of those things are under your control, some are not.

#2 On a field scale and discreet basis timing of manure and fertilizer application drives losses of phosphorus.

#3 Controlling soil losses is the first step to managing phosphorus loss. Placement of nutrients also needs attention.

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